This Order only regulates surface water discharges to the Woods Creek, which may only occur from 1 December through 15 May, when wastewater flows exceed the Facility's effluent storage and disposal capacity during high precipitation years.

A. Description of Wastewater and Biosolids Treatment or Controls

The TUD SRWTP secondary treatment facilities consists of headworks with revolving screen, a screening wash system, a bar screen, a Parshall flume, a grit removal system, primary clarifiers, trickling filters, secondary clarifiers, polishing ponds, chlorination and de-chlorination facilities, re-circulation pumps, centrifuge, primary and secondary anaerobic digesters, sludge drying beds, and effluent storage ponds. Chlorination occurs at the pump station, where chlorine is piped as a gas and mixed on demand triggered by the pump station controls. Chlorinated effluent is pumped into Quartz Reservoir for storage. Biosolids are disposed off-site at a regulated beneficial reuse land application site.

The JSD treatment plant provides secondary treatment with chlorination. The plant consists of the headworks, primary clarifier, trickling filter, secondary clarifier, aerobic sludge digester, chlorination facilities, a sludge storage lagoon, sludge drying beds, and an equalization basin. Chlorination occurs at the pump station.

The Discharger anticipates the discharge to surface water would occur only during high precipitation years during which effluent flows are highest due to high infiltration and inflow, agricultural irrigation needs are lowest, winter/spring storage needs are greatest, and only when there is a threat of overflow from the Quartz storage reservoir.

B. Discharge Points and Receiving Waters

1. The SRWTP storage ponds, and disposal sites are in Section1, T1N, R14E, MDB&M, with surface water drainage to the Tuolumne River and Don Pedro Reservoir via Woods Creek as shown in Attachment B (Figure B-1), which is a part of this Order.

2. Secondary treated and disinfected municipal wastewater is discharged to Woods Creek, a water of the United States at a point Latitude N37°, 55', 20" and longitude W120°, 25', 53". The Woods Creek is within the Tuolumne River watershed management area.

Table F-2. Summary of Existing Requirements and Self-Monitoring Report (SMR) Data

		Effluent Limitations					Discharge Reported Data (from Dec 2003 to April 2004	
Constituents	Units	Monthly Average	Weekly Average	Daily Maximum	4-day Average	1-hour Average	Highest Avg. Monthly	Highest Daily
BOD	mg/l	30	45	60			25	28
	lbs/day[3]	775	1163	1550			327	378
TSS	mg/l	30	45	90			26	27
	lbs/day[3]	775	1163	2326			343	364
Total Coliform	MPN/100ml	23		230			23	>1600
Settleable Solids	ml/l	0.1		0.2			<0.1	<0.2
Chlorine Residual	mg/l	---		---	0.011	0.019	ND	ND
	lbs/day[3]	---		---	0.28	0.49		
Oil and Grease	mg/l	10			15		N.A.	N.A.
	lbs/day[3]	258			388		N.A.	N.A.
Ammonia-N	mg/l	Varies[4]				Varies[4]	15	18

Footnotes
[1] 5-day, 20°C biochemical oxygen demand (BOD).
[2] To be ascertained by a 24-hour composite.
[3] Based upon a daily peak wet weather flow rate of 3.1 mgd.
[4] Effluent limitations vary based on pH and/or temperature at the time of discharge. A dilution credit of 10:1 allowed.

D. Compliance Summary

No compliance issues noted

E. Planned Changes – Not Applicable

III. APPLICABLE PLANS, POLICIES, AND REGULATIONS

The requirements contained in this Order are based on the applicable plans, policies, and regulations identified in section II of the Limitations and Discharge Requirements (Findings). This section provides supplemental information, where appropriate, for the plans, policies, and regulations relevant to the discharge.

A. Legal Authority

See Limitations and Discharge Requirements - Findings, Section II.C.

B. California Environmental Quality Act (CEQA)

See Limitations and Discharge Requirements - Findings, Section II.E.

C. State and Federal Regulations, Policies, and Plans

1. **Water Quality Control Plans.** The Regional Water Board adopted a *Water Quality Control Plan, Fourth Edition (Revised August 2006), for the Sacramento and San Joaquin River Basins* (Basin Plan) that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan. The Basin Plan at page II-2.00 states that the "*...beneficial uses of any specifically identified water body generally apply to its tributary streams.*" The Basin Plan does not specifically identify beneficial uses for *Woods Creek,* but does identify present and potential uses for *Tuolumne River* to which *Woods Creek*, via *New Don Pedro Reservoir*, is tributary. In addition, State Water Board Resolution No. 88-63 requires that, with certain exceptions, the Regional Water Board assign the municipal and domestic supply use to water bodies that do not have beneficial uses listed in the Basin Plan. The beneficial uses of the Woods Creek downstream of the discharge are: municipal and domestic supply (MUN); agricultural supply, including stock watering (AGR); hydropower generation; water contact recreation, including canoeing and rafting (REC-1); non-contact water recreation, including aesthetic enjoyment (REC-2); commercial and sport fishing; aquaculture; warm freshwater habitat; cold freshwater habitat; and wildlife habitat.

   The Basin Plan on page II-1.00 states: "*Protection and enhancement of existing and potential beneficial uses are primary goals of water quality planning...*" and with respect to disposal of wastewaters states that "*...disposal of wastewaters is [not] a prohibited use of waters of the State; it is merely a use which cannot be satisfied to the detriment of beneficial uses.*"

   The federal CWA section 101(a)(2), states: "*it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife, and for recreation in and on the water be achieved by July 1, 1983.*" Federal Regulations, developed to implement the requirements of the CWA, create a rebuttable presumption that all waters be designated as fishable and swimmable. Federal Regulations, 40 CFR sections 131.2 and 131.10, require that all waters of the State regulated to protect the beneficial uses of public water supply, protection and propagation of fish, shell fish and wildlife, recreation in and on the water, agricultural, industrial and other purposes including navigation. Section 131.3(e), 40 CFR, defines existing beneficial uses as those uses actually attained after November 28, 1975, whether or not they are included in the water quality standards. Federal Regulation, 40 CFR section 131.10 requires that uses be obtained by implementing effluent limitations, requires that all downstream uses be protected and states that in no case shall a state adopt waste transport or waste assimilation as a beneficial use for any waters of the United States.

2. **Antidegradation Policy.** Section 131.12 requires that the state water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law.

Resolution No. 68-16 requires that existing water quality be maintained unless degradation is justified based on specific findings. The Regional Water Board's Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. As discussed in detail in the Fact Sheet (Attachment F, Section IV.D.4) the discharge is consistent with the antidegradation provisions of 40 CFR section 131.12 and State Water Board Resolution 68-16.

3. **Anti-Backsliding Requirements.** Sections 402(o)(2) and 303(d)(4) of the CWA and federal regulations at title 40, Code of Federal Regulations section 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require that effluent limitations in a reissued permit must be as stringent as those in the previous permit, with some exceptions in which limitations may be relaxed. Compliance with anti-backsliding requirements is discussed in Section IV.D.3

4. **Emergency Planning and Community Right to Know Act**. Section 13263.6(a), California Water Code, requires that "*the Regional Water Board shall prescribe effluent limitations as part of the waste discharge requirements of a POTW for all substances that the most recent toxic chemical release data reported to the state emergency response commission pursuant to Section 313 of the Emergency Planning and Community Right to Know Act of 1986 (42 U.S.C. Sec. 11023) (EPCRKA) indicate as discharged into the POTW, for which the State Water Board or the Regional Water Board has established numeric water quality objectives, and has determined that the discharge is or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to, an excursion above any numeric water quality objective*". However, the Regional Water Board has determined that no toxic chemical release data has been reported to the state emergency response commission for the discharge into the POTW.

5. **Stormwater Requirements.** USEPA promulgated Federal Regulations for storm water on 16 November 1990 in 40 CFR Parts 122, 123, and 124. The NPDES Industrial Storm Water Program regulates storm water discharges from wastewater treatment facilities. Wastewater treatment plants are applicable industries under the stormwater program and are obligated to comply with the Federal Regulations.

6. ***Water Reuse Policy.*** The Basin Plan's Water Reuse Policy states, "*The Regional Water Board encourages the reclamation and reuse of wastewater...and requires as part of a Report of Waste Discharge an evaluation of reuse and land disposal options as alternative disposal methods. Reuse options should include consideration of the following, where appropriate, based on the quality of the wastewater and the required quality for the specific reuses: industrial and municipal supply, crop irrigation, landscape irrigation, ground water recharge, and wetland restoration.*" The purpose of the Water Reuse Policy is to evaluate alternative methods of disposal to prevent unnecessary discharges to surface water

   The Discharger disposes of treated wastewater via spray or flood irrigation of fodder crops and pasture lands owned either by the TUD or private parties under contract for the use of the reclaimed wastewater. The land discharge is regulated by WDRs Order No. 94-192 and WRRs Order No. R5-2002-0202. Both these Orders require

that the Discharger maintain sufficient storage capacity to accommodate allowable wastewater flow, design seasonal precipitation, and ancillary inflow and infiltration during a 100-year rainfall year. The Discharger has documented through a feasibility study report titled, *TUD Reclamation System Improvements, Feasibility Study* (August 2005) that the critical element for effluent disposal to land is its effluent storage capacity. The Discharger further documents that the alternatives that best meet the long-term needs of the Discharger is the addition of land for irrigation, the retention of the ability for seasonal surface water discharge during high precipitation years, and increased storage.

Also, in response to the C&D Order, the Discharger submitted water balances for the water reclamation system to assess whether adequate storage and disposal capacity is available for anticipated flow rates. The water balances were prepared based on crop water and nutrient needs, quality and quantity of applied water, historical climate data, and 100-year annual return total rainfall amounts. The water balances indicated that without significant changes to the wastewater reclamation system, some seasonal discharge to Woods Creek would continue to be required during extremely wet winters when effluent flows are maximized and end-use needs for reclaimed water are minimized. Since the preparation of those water balances, the Discharger has added approximately 100 more acres of land for wastewater reclamation application, and obtained NPDES Permit No. CA 0084727 (WDRs Order No. 5-01-043) for the winter-time discharge of excess effluent during years of above average precipitation.

Currently, the effluent storage capacity of the Quartz Reservoir is approximately 1200 ac-ft. The estimated long-term effluent storage requirement, during a 100-year rainfall year, is approximately 1600 acre-feet. Due to a lack of adequate storage capacity, the Discharger experienced unauthorized overflows from its storage reservoir during the winter months from1995 through 1999. As a result, Cease and Desist Order No. R5-00-002 was issued in January 2000 for failure to meet the discharge requirements.

The Discharger evaluated several irrigation sites to accommodate the long-term disposal needs projected for build-out. This evaluation also included expanding the existing effluent storage facilities or constructing new facilities at new sites. In addition, potential factors to reduce wastewater flows were also considered and their estimated impact on effluent storage requirements were estimated. The Feasibility Study concluded the alternatives that best meet the long-term needs of the TUD is the addition of land for irrigation, the retention of the ability for seasonal surface water discharge during high precipitation years, and increased storage.

D. Impaired Water Bodies on CWA 303(d) List

1. Under Section 303(d) of the 1972 Clean Water Act, states, territories and authorized tribes are required to develop lists of water quality limited segments. The waters on these lists do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology. On 30

November 2006 USEPA gave final approval to California's 2006 Section 303(d) List of Water Quality Limited Segments. The Basin Plan references this list of Water Quality Limited Segments (WQLSs), which are defined as "*...those sections of lakes, streams, rivers or other fresh water bodies where water quality does not meet (or is not expected to meet) water quality standards even after the application of appropriate limitations for point sources (40 CFR 130, et seq.).*" The Basin Plan also states, "*Additional treatment beyond minimum federal standards will be imposed on dischargers to [WQLSs]. Dischargers will be assigned or allocated a maximum allowable load of critical pollutants so that water quality objectives can be met in the segment.*" The 2006 303(d) list does not have listings for the upper Woods Creek where the treated effluent is proposed to be discharged.

E. Other Plans, Polices and Regulations

1. The discharge authorized herein and the treatment and storage facilities associated with the discharge of treated municipal wastewater, except for discharges of residual sludge and solid waste, are exempt from the requirements of Title 27, California Code of Regulations (CCR), section 20005 *et seq.* (hereafter Title 27). The exemption, pursuant to Title 27 CCR section 20090(a), is based on the following:

   a. The waste consists primarily of domestic sewage and treated effluent;

   b. The waste discharge requirements are consistent with water quality objectives; and

   c. The treatment and storage facilities described herein are associated with a municipal wastewater treatment plant.

IV. RATIONALE FOR EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

Effluent limitations and toxic and pretreatment effluent standards established pursuant to Sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations), 304 (Information and Guidelines), and 307 (Toxic and Pretreatment Effluent Standards) of the Clean Water Act (CWA) and amendments thereto are applicable to the discharge.

The Federal CWA mandates the implementation of effluent limitations that are as stringent as necessary to meet water quality standards established pursuant to state or federal law [33 U.S.C., § 1311(b)(1)(C); 40 CFR, § 122.44(d)(1)]. NPDES permits must incorporate discharge limits necessary to ensure that water quality standards are met. This requirement applies to narrative criteria as well as to criteria specifying maximum amounts of particular pollutants. Pursuant to Federal Regulations, 40 CFR Section 122.44(d)(1)(i), NPDES permits must contain limits that control all pollutants that "*are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality.*" Federal Regulations, 40 CFR, §122.44(d)(1)(vi), further provide that "[w]*here a state has not established a water quality criterion for a specific chemical pollutant that is present in an effluent at a concentration that causes, has the reasonable potential to cause, or contributes to an excursion above a narrative criterion within an applicable State water*

quality standard, the permitting authority must establish effluent limits."

The CWA requires point source discharges to control the amount of conventional, non-conventional, and toxic pollutants that are discharged into the waters of the United States. The control of pollutants discharged is established through effluent limitations and other requirements in NPDES permits. There are two principal bases for effluent limitations: 40 CFR §122.44(a) requires that permits include applicable technology-based limitations and standards, and 40 CFR §122.44(d) requires that permits include water quality-based effluent limitations to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water where numeric water quality objectives have not been established. The Regional Water Board's Basin Plan, page IV-17.00, contains an implementation policy ("Policy for Application of Water Quality Objectives" that specifies that the Regional Water Board "*will, on a case-by-case basis, adopt numerical limitations in orders which will implement the narrative objectives.*" This Policy complies with 40 CFR §122.44(d)(1). With respect to narrative objectives, the Regional Water Board must establish effluent limitations using one or more of three specified sources, including (1) EPA's published water quality criteria, (2) a proposed state criterion (*i.e.*, water quality objective) or an explicit state policy interpreting its narrative water quality criteria (*i.e.*, the Regional Water Board's "Policy for Application of Water Quality Objectives")(40 CFR 122.44(d)(1) (vi) (A), (B) or (C)), or (3) an indicator parameter. The Basin Plan contains a narrative objective requiring that: "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life*" (narrative toxicity objective). The Basin Plan requires the application of the most stringent objective necessary to ensure that surface water and groundwater do not contain chemical constituents, discoloration, toxic substances, radionuclides, or taste and odor producing substances that adversely affect beneficial uses. The Basin Plan states that material and relevant information, including numeric criteria, and recommendations from other agencies and scientific literature will be utilized in evaluating compliance with the narrative toxicity objective. The Basin Plan also limits chemical constituents in concentrations that adversely affect surface water beneficial uses. For waters designated as municipal, the Basin Plan specifies that, at a minimum, waters shall not contain concentrations of constituents that exceed Maximum Contaminant Levels (MCL) of CCR Title 22. The Basin Plan further states that, to protect all beneficial uses, the Regional Water Board may apply limits more stringent than MCLs.

A. Discharge Prohibitions

1. *As stated in section I.G of Attachment D, Standard Provisions, this Order prohibits bypass from any portion of the treatment facility. Federal Regulations, 40 CFR 122.41 (m), define "bypass" as the intentional diversion of waste streams from any portion of a treatment facility. This section of the Federal Regulations, 40 CFR 122.41 (m)(4), prohibits bypass unless it is unavoidable to prevent loss of life, personal injury, or severe property damage. In considering the Regional Water Board's prohibition of bypasses, the State Water Board adopted a precedential decision, Order No. WQO 2002-0015, which cites the Federal Regulations, 40 CFR 122.41(m), as allowing bypass only for essential maintenance to assure efficient operation.*

2. Due to insufficient wintertime storage capacity during high rainfall years, direct discharge to the Woods Creek from the Quartz Reservoir is permitted from 1 December through 15 May when the dilution ratio of Woods Creek to effluent discharge flow is at least 20:1, on a daily average, as measured upstream from the Discharge Point.

B. Technology-Based Effluent Limitations

1. Scope and Authority

Regulations promulgated in section 125.3(a)(1) of the Code of Federal regulations require technology-based effluent limitations for municipal Dischargers to be placed in NPDES permits based on Secondary Treatment Standards or Equivalent to Secondary Treatment Standards.

The Federal Water Pollution Control Act Amendments of 1972 (PL 92-500) established the minimum performance requirements for POTWs [defined in section 304(d)(1)]. Section 301(b)(1)(B) of that Act requires that such treatment works must, as a minimum, meet effluent limitations based on secondary treatment as defined by the USEPA Administrator.

Based on this statutory requirement, USEPA developed secondary treatment regulations, which are specified in Part 133. These technology-based regulations apply to all municipal wastewater treatment plants and identify the minimum level of effluent quality attainable by secondary treatment in terms of biochemical oxygen demand (BOD_5), total suspended solids (TSS), and pH.

2. Applicable Technology-Based Effluent Limitations (TBEL)

a. **BOD_5 and TSS.** Federal Regulations, 40 CFR, Part 133, establish the minimum weekly and monthly average level of effluent quality attainable by secondary treatment for BOD_5 and TSS. In addition to the average weekly and average monthly effluent limitations, a daily maximum effluent limitation for BOD_5 and TSS is also included in the Order to ensure that the treatment works are not organically overloaded and operate in accordance with design capabilities. See Table F-3 for final technology-based effluent limitations required by this Order. In addition, 40 CFR 133.102, in describing the minimum level of effluent quality attainable by secondary treatment, states that the 30-day average percent removal shall not be less than 85 percent. This Order contains a limitation requiring an average of 85 percent removal of BOD_5 and TSS over each calendar month.

b. **Flow.** The SRWTP was designed to provide a secondary level of treatment for up to a design flow of 2.6 mgd ADWF and a peak wet weather flow of 3.1 mgd. Current annual average daily flow to the facility is 1.9 mgd. The JSD Facility was designed to provide a secondary level of treatment for up to a design flow of 0.28 mgd ADWF and a peak wet weather flow of 1.1 mgd. Current annual average daily flow to the facility is 0.23 mgd. Based on the water balance, the proposed

volume of water that must be discharged to surface water to provide adequate disposal capacity during 100-year rainfall year is approximately 88 MG/yr. Therefore, during the surface discharge period (from December 1 through May 15), it is estimated that 2.9 mgd, as a monthly average, needs to be discharged to Woods Creek to maintain the reservoir at a maximum level of 2 feet below spillway and to avoid overflows. Consequently, this Order contains a Monthly Average Discharge Flow effluent limit of 2.9 mgd.

Summary of Technology-Based Effluent Limitations
Discharge Point – 001

Table F-3. Summary of Technology-based Effluent Limitations (from Quartz Reservoir)

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
5-Day BOD	mg/l	30	45	60	---	---
	lbs/day[1]	726	1088	1452	---	---
Total Suspended Solids	mg/l	30	45	90	---	---
	lbs/day[1]	726	1088	2176	---	---
Flow	mgd	2.9	---	---	---	---

1 Based on discharge flow of 2.9 mgd.

C. Water Quality-Based Effluent Limitations (WQBELs)

1. Scope and Authority

As specified in section 122.44(d)(1)(i), permits are required to include WQBELs for pollutants (including toxicity) that are or may be discharged at levels that cause, have reasonable potential to cause, or contribute to an in-stream excursion above any state water quality standard. The process for determining reasonable potential and calculating WQBELs when necessary is intended to protect the designated uses of the receiving water as specified in the Basin Plan, and achieve applicable water quality objectives and criteria that are contained in other state plans and policies, or any applicable water quality criteria contained in the CTR and NTR.

2. Applicable Beneficial Uses and Water Quality Criteria and Objectives

a. **Receiving Water.** The receiving water is Woods Creek, a tributary to new Don Pedro Reservoir and the Tuolumne River. The beneficial uses of the Woods Creek are described above in Section III.C.1 of this Fact Sheet. Woods Creek is a small ephemeral stream ranging in width between 3 ft. to 4 ft., with the lowest flow reported as 0.46 cubic feet per second during the non-discharge season. Dry conditions in the Creek occur primarily in the hot summer months, but dry conditions may also occur throughout the year, particularly in low rainfall years.

b. **Hardness.** While no effluent limitation for hardness is necessary in this Order, hardness is critical to the assessment of the need for, and the development of, effluent limitations for certain metals. The *California Toxics Rule* and the *National Toxics Rule* contain water quality criteria for seven metals that vary as a

function of hardness, the lower the hardness, the lower the water quality criteria. The hardness-dependent metal criteria include cadmium, copper, chromium III, lead, nickel, silver, and zinc.

Effluent limitations for the discharge must be set to protect the beneficial uses of the receiving water for all discharge conditions. In the absence of the option of including condition-dependent, "floating" effluent limitations that are reflective of actual hardness conditions at the time of discharge, effluent limitations must be set using a reasonable worst-case condition in order to protect beneficial uses for all discharge conditions. The SIP does not address how to determine hardness for application to the equations for the protection of aquatic life when using hardness-dependent metals criteria. It simply states, in Section 1.2, that the criteria shall be properly adjusted for hardness using the hardness of the receiving water. The CTR requires that, for waters with a hardness of 400 mg/L (as $CaCO_3$), or less, the actual ambient hardness of the surface water must be used. It further requires that the hardness values used must be consistent with the design discharge conditions for design flows and mixing zones.[1] The CTR does not define whether the term "ambient," as applied in the regulations, necessarily requires the consideration of upstream as opposed to downstream hardness conditions.

The point in the receiving water affected by the discharge is downstream of the discharge. As the effluent mixes with the receiving water, the hardness of the receiving water can change. Therefore, it is appropriate to use the ambient hardness downstream of the discharge that is a mixture of the effluent and receiving water for the determination of the CTR hardness-dependent metals criteria. Recent studies indicate that using the lowest recorded receiving water hardness for establishing water quality criteria is not always protective of the receiving water under various mixing conditions (e.g. when the effluent hardness is less than the receiving water hardness). The studies evaluated the relationships between hardness and the CTR metals criterion that is calculated using the CTR metals equation. The equation describing the total recoverable regulatory criterion, as established in the CTR, is as follows:

$$\text{CTR Criterion} = e^{m[\ln(H)]+b} \qquad \text{(Equation 1)}$$

Where:

H = Hardness
b = metal- and criterion-specific constant
m = metal- and criterion-specific constant

[1] See 40 CFR 131.38(c)(4)(i)

The constants "m" and "b" are specific to both the metal under consideration, and the type of total recoverable criterion (i.e. acute or chronic). The metal-specific values for these constants are provided in the CTR at paragraph (b)(2), Table 1.

The relationship between hardness and the resulting criterion in Equation 1 can exhibit either a downward-facing (i.e., concave downward) or an upward-facing (i.e., concave upward) curve depending on the values of the criterion-specific constants. The curve shapes for acute and chronic criteria for the metals are as follows:

Concave Downward: cadmium (chronic), chromium (III), copper, nickel, and zinc

Concave Upward: cadmium (acute), lead, and silver (acute)

For those contaminants where the regulatory criteria exhibit a concave downward relationship as a function of hardness, use of the lowest recorded effluent hardness for establishment of water quality objectives is fully protective of all beneficial uses regardless of whether the effluent or receiving water hardness is higher. Use of the lowest recorded effluent hardness is also protective under all possible mixing conditions between the effluent and the receiving water (i.e., from high dilution to no dilution). Therefore, for cadmium (chronic), chromium (III), copper, nickel, and zinc, the reasonable worst-case ambient hardness can be estimated by using the lowest effluent hardness. The water quality criteria for these metals were calculated for this Order using Equation 1 and a reported minimum effluent hardness of 70 mg/L as $CaCO_3$ was used, based on 12 samples collected from January 2002 through December 2002.

For those metals where the regulatory criteria exhibit a concave upward relationship as a function of hardness, a water quality objective based on either the effluent hardness or the receiving water hardness alone, would not be protective under all mixing scenarios. Instead, both the hardness of the receiving water and the effluent is required to determine the reasonable worst-case ambient hardness. The following equation provides fully protective water quality criteria for those metals that exhibit a concave upward relationship.

$$\text{CTR Criterion} = \left[\frac{m}{H_{rw}} \cdot \left(H_{eff} - H_{rw} \right) + 1 \right] \cdot e^{m \cdot \ln(H_{rw}) + b} \qquad \text{(Equation 2)}$$

Where:

H_{eff} = Effluent hardness
H_{rw} = Receiving water hardness
b = metal- and criterion-specific constant
m = metal- and criterion-specific constant

Therefore, for cadmium (acute), lead, and silver (acute) water quality criteria were calculated using Equation 2 with an effluent hardness of 70 mg/L as $CaCO_3$ and a receiving water hardness of 120 mg/L as $CaCO_3$.

c. **Assimilative Capacity/Mixing Zone.** Section 1.4.2.2 of the SIP requires that the Discharger provide information necessary for the Regional Water Board to make a determination on allowing a mixing zone, including the calculations for deriving the appropriate receiving water and effluent flows, and/or the results of a mixing zone study. The SIP also states, in part, "*...the Regional Board may grant mixing zones and dilution credits to dischargers in accordance with the provisions of this section... The applicable priority pollutant criteria and objectives are to be met throughout a water body except within any mixing zone granted by the Regional Board. The allowance of mixing zones is discretionary and shall be determined on a discharge-by-discharge basis.*"

The SIP lists conditions that must be met in allowing a mixing zone, and states that the Regional Water Board "*shall deny or significantly limit a mixing zone and dilution credit as necessary to protect beneficial uses, meet the conditions of this Policy, or comply with other regulatory requirements.*"

For incompletely mixed discharges, the SIP provides that: "*Dilution credits and mixing zones for incompletely-mixed discharges shall be considered by the RWQCB only after the discharger has completed an independent mixing zone study and demonstrated to the satisfaction of the RWQCB that a dilution credit is appropriate.*" For completely mixed discharges, the SIP states, "*...the amount of receiving water available to dilute the effluent shall be determined by calculating the dilution ratio (i.e. the critical receiving water flow divided by the effluent flow)...*"

USEPA's current water quality standards regulation authorizes states to adopt general policies, such as mixing zones, to implement state water quality standards (40 CFR §122.44 and §122.45). The USEPA allows states to have broad flexibility in designing their mixing zone policies. Primary guidance on determining mixing zone and dilution credits is provided by the SIP, the USEPA Technical Support Document (TSD) for Water Quality-based Toxics Control (EPA/505/2-90-001), and the Basin Plan. For NPDES permits in California, the SIP guidance supercedes the USEPA guidance for priority pollutants, to the extent that it addresses a particular procedure. However, for non-priority pollutants, the more stringent of the Basin Plan or US EPA guidance may apply.

In granting a mixing zone, the SIP states that a mixing zone shall be as small as practicable, and meet the conditions provided in Section 1.4.2.2 as follows:

"A: A mixing zone shall not:
(1) compromise the integrity of the entire water body;
(2) cause acutely toxic conditions to aquatic life passing through the mixing zone;
(3) restrict the passage of aquatic life;

(4) adversely impact biologically sensitive or critical habitats, including, but not limited to, habitat of species listed under federal or State endangered species laws;

(5) produce undesirable or nuisance aquatic life;

(6) result in floating debris, oil, or scum;

(7) produce objectionable color, odor, taste, or turbidity;

(8) cause objectionable bottom deposits;

(9) cause nuisance;

(10) dominate the receiving water body or overlap a mixing zone from different outfalls; or

(11) be allowed at or near any drinking water intake. A mixing zone is not a source of drinking water. To the extent of any conflict between this determination and the Sources of Drinking Water Policy (Resolution No. 88-63), this SIP supersedes the provisions of that policy."

Acute and Chronic Aquatic Life Criteria. For acute (1-hour) and chronic (4-day and 30-day) criteria, the discharge is assumed to be incompletely mixed, based on the information provided by the Discharger. The discharge to Woods Creek is via a side channel, therefore, complete mixing may not occur. For incompletely mixed discharges, the SIP requires that to consider dilution credits a dilution/mixing zone study must be performed. The previous permit required the Discharger to conduct a Dilution/Mixing Zone Study. The Discharger submitted a mixing zone study report dated 25 August 2005, titled *Mixing Zone Study Quartz Reservoir Winter Overflow to Woods Creek*, developed by Kennedy/Jenks Consults. Kennedy/Jenks Consultants utilized the CORMIX computer model to simulate the mixing zone and dilution of the discharge to Woods Creek. However, the study doesn't include sufficient detail to adequately determine protective dilution credits for compliance with acute and chronic aquatic life criteria. Therefore, this Order requires end-of-pipe effluent limitations for compliance with these criteria. A reopener provision is provided to reconsider dilution credits should the Discharger provide adequate justification.

Human Health Criteria. For long-term human health criteria it is a valid assumption that the discharge is completely mixed with the receiving water. This approach is appropriate for long-term human health criteria where critical environmental effects are expected to occur far downstream from the source. The Discharger's dilution study, though not sufficient for development of dilution credits for near-field criteria (i.e. acute and chronic aquatic toxicity criteria), includes information useful in the determination of the dilution credits for far-field criteria (i.e. human health criteria). The dilution study predicted the distance downstream where complete mixing will occur. The dilution study predicted that complete mixing will occur between 87 to 135 feet downstream of the discharge, depending on the Manning roughness coefficient. This Order includes Discharge Prohibition III.E. that requires at least a 20:1 flow ratio (Woods Creek:effluent) at all times. Therefore, a dilution credit of 20:1 is allowed for compliance with long-term human health criteria, which allows a mixing zone 135 feet long.

Consistency with Mixing Zone Requirements. This Order only allows a mixing zone for human health criteria. This Order does not allow mixing zones for compliance with aquatic toxicity criteria. The mixing zone is as small as practicable, will not compromise the integrity of the entire water body, restrict the passage of aquatic life, dominate the waterbody or overlap existing mixing zones from different outfalls. The discharge enters Woods Creek approximately 2 miles upstream of Don Pedro Reservoir, which is a source of drinking water. The human health criteria mixing zone extends 135 feet downstream of the discharge. There is significant dilution, much more than the allowed 20:1 in this Order, prior to any drinking water intake at Don Pedro Reservoir. There are no drinking water intakes on Woods Creek and the mixing zone does not overlap a mixing zone from another outfall.

The discharge will not cause acutely toxic conditions to aquatic life passing through the mixing zone, because this Order does not allow an acute aquatic life mixing zone and requires compliance with an acute toxicity effluent limitation that requires acute bioassays using 100% effluent (i.e. no dilution). Compliance with the acute toxicity effluent limitation assures the effluent is not acutely toxic.

The discharge will not adversely impact biologically sensitive or critical habitats, including, but not limited to, habitat of species listed under federal or State endangered species laws, because this Order does not allow mixing zones for compliance with aquatic toxicity criteria. The Discharger must meet stringent end-of-pipe effluent limitations for constituents that demonstrated reasonable potential to exceed aquatic toxicity criteria (i.e. ammonia, copper, zinc and total residual chlorine).

The discharge will not produce undesirable or nuisance aquatic life, result in floating debris, oil, or scum, produce objectionable color, odor, taste, or turbidity, cause objectionable bottom deposits, or cause nuisance, because this Order requires end-of-pipe effluent limitations (e.g. for biochemical oxygen demand and total suspended solids) and discharge prohibitions to prevent these conditions from occurring.

As suggested by the SIP, in determining the extent of or whether to allow a mixing zone and dilution credit, the Regional Water Board has considered the presence of pollutants in the discharge that are carcinogenic, mutagenic, teratogenic, persistent, bioaccumulative, or attractive to aquatic organisms, and concluded that the allowance of the mixing zone and dilution credit is adequately protective of the beneficial uses of the receiving water.

The mixing zone therefore complies with the SIP. The mixing zone also complies with the Basin Plan, which requires that the mixing zone not adversely impact beneficial uses. Beneficial uses will not be adversely affected for the same reasons discussed above. In determining the size of the mixing zone, the Regional Water Board has considered the procedures and guidelines in the EPA's Water Quality Standards Handbook, 2d Edition (updated July 2007),

Section 5.1, and Section 2.2.2 of the Technical Support Document for Water Quality-based Toxics Control (TSD). The SIP incorporates the same guidelines. For these reasons, the mixing zone will be not be adverse to the purpose of the state and federal antidegradation policies.

3. Determining the Need for WQBELs

a. CWA section 301 (b)(1) requires NPDES permits to include effluent limitations that achieve technology-based standards and any more stringent limitations necessary to meet water quality standards. Water quality standards include Regional Water Board Basin Plan beneficial uses and narrative and numeric water quality objectives, State Water Board-adopted standards, and federal standards, including the CTR and NTR. The Basin Plan includes numeric site-specific water quality objectives and narrative objectives for toxicity, chemical constituents, and tastes and odors. The narrative toxicity objective states: "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.*" (Basin Plan at III-8.00.) With regards to the narrative chemical constituents objective, the Basin Plan states that waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses. At minimum, "*...water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs)*" in Title 22 of CCR. The narrative tastes and odors objective states: "*Water shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to domestic or municipal water supplies or to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses.*"

b. Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numerical water quality standard. Based on information submitted as part of the application, in studies, and as directed by monitoring and reporting programs, the Regional Water Board finds that the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a water quality standard for ammonia, aluminum, copper, iron, manganese, nitrate, nitrite, and zinc. Water quality-based effluent limitations (WQBELs) for these constituents are included in this Order. A summary of the reasonable potential analysis (RPA) is provided in Table F-5, and a detailed discussion of the RPA for each constituent is provided below.

c. The Regional Water Board conducted the RPA in accordance with Section 1.3 of the SIP. Although the SIP applies directly to the control of CTR priority pollutants, the State Water Board has held that the Regional Water Board may use the SIP as guidance for water quality-based toxics control[2]. The SIP states in the introduction "*The goal of this Policy is to establish a standardized approach for permitting discharges of toxic pollutants to non-ocean surface waters in a*

[2] See, Order WQO 2001-16 (Napa) and Order WQO 2004-0013 (Yuba City)

manner that promotes statewide consistency." Therefore, in this Order the RPA procedures from the SIP were used to evaluate reasonable potential for both CTR and non-CTR constituents.

d. WQBELs were calculated in accordance with section 1.4 of the SIP, as described in Attachment F, Section IV.C.4.

e. **Aluminum.** The Secondary Maximum Contaminant Level (MCL) - Consumer Acceptance Limit for aluminum is 200 µg/L and is applied for the protection of the MUN beneficial use. For protection of freshwater aquatic life, the Regional Water Board in the past has used USEPA's criteria for prevention of acute and chronic toxicity to implement the Basin Plan's narrative toxicity objective for aluminum. The recommended four-day average (chronic) and one-hour average (acute) criteria for aluminum are 87 µg/L and 750 µg/L, respectively, for waters with a pH of 6.5 to 9.0. The most stringent of these criteria is the chronic criteria of 87 ug/L. This criteria is based on studies conducted on waters with low pH (6.5 to 6.8 pH units) and hardness (<10 mg/L as $CaCO_3$), conditions not commonly observed in Central Valley receiving waters like Woods Creek. Thus the criteria is likely overly protective for this application. For similar reasons, the Utah Department of Environmental Quality (Department) only applies the 87 µg/L chronic criterion for aluminum where the pH is less than 7.0 and the hardness is less than 50 mg/L as $CaCO_3$ in the receiving water after mixing. For conditions where the pH equals or exceeds 7.0 and the hardness is equal to or exceeds 50 mg/L as CaCO3, the Department regulates aluminum based on the 750 µg/L acute criterion. Therefore, in the case of Woods Creek where both the pH and hardness ranged from 7.7 to 8.4, and 120 mg/l to 221 mg/l, respectively, it is unlikely that application of the stringent chronic criteria (87µg/L) is necessary to protect aquatic life.

   The MEC for aluminum was 67 µg/L, and the maximum annual average effluent concentration was 35 µg/L, while the maximum observed upstream receiving water aluminum concentration was 201 µg/L, and the maximum annual average receiving water concentration was 78 µg/L, based on 11 samples collected during January 2002 and December 2002. The maximum receiving water aluminum concentration and MEC do not exceed the NAWQC for aluminum (750 µg/L), and the annual average receiving water and effluent concentrations do not exceed the Secondary MCL (200 µg/L), therefore, aluminum in the discharge does not have a reasonable potential to cause or contribute to an exceedance of applicable water quality criteria. The maximum annual average receiving water and effluent concentrations were used in the RPA for evaluating the secondary MCL based on input from the California Department of Public Health and the fact that MCLs are designed to protect human health over long exposure periods. Therefore, it is appropriate to analyze reasonable potential based on an annual average concentration.

f. **Ammonia.** Untreated domestic wastewater contains ammonia. Nitrification is biological process that converts ammonia to nitrite and nitrite to nitrate. Denitrification is a process that converts nitrate to nitrite or nitric oxide and then

to nitrous oxide or nitrogen gas, which is then released to the atmosphere. The Discharger currently uses nitrification to remove ammonia from the waste stream. Inadequate or incomplete nitrification may result in the discharge of ammonia to the receiving stream. Ammonia is known to cause toxicity to aquatic organisms in surface waters. Discharges of ammonia would violate the Basin Plan narrative toxicity objective. Applying 40 CFR section 122.44(d)(1)(vi)(B), it is appropriate to use USEPA's Ambient National Water Quality Criteria for the Protection of Freshwater Aquatic Life for ammonia, which was developed to be protective of aquatic organisms.

USEPA's *Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life*, for total ammonia, recommends acute (1-hour average; criteria maximum concentration) standards based on pH and chronic (30-day average, criteria continuous concentration) standards based on pH and temperature. It also recommends a maximum four-day average concentration of 2.5 times the criteria continuous concentration. USEPA found that as pH increased, both the acute and chronic toxicity of ammonia increased. Salmonids were more sensitive to acute toxicity effects than other species. However, while the acute toxicity of ammonia was not influenced by temperature, it was found that invertebrates and young fish experienced increasing chronic toxicity effects with increasing temperature. Because the Woods Creek has a beneficial use of cold freshwater habitat and the potential for the presence of salmonids and early fish life stages, the recommended criteria for waters where salmonids and early life stages are present were used. USEPA's recommended criteria are shown below:

$$CCC_{30-day} = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}}\right) \times MIN\left(2.85, 1.45 \cdot 10^{0.028(25-T)}\right), \text{ and}$$

$$CMC = \left(\frac{0.275}{1+10^{7.204-pH}} + \frac{39.0}{1+10^{pH-7.204}}\right),$$

where T is in degrees Celsius.

The maximum permitted effluent pH is 8.5. The Basin Plan objective for pH in the receiving stream is in the range of 6.5 to 8.5. In order to protect against the worst-case short-term exposure of an organism, a pH value of 8.5 was used to derive the acute criterion. The resulting acute criterion is 2.14 mg/L, calculated with salmonids present.

There is not enough representative receiving water monitoring data to determine the chronic criterion based on the receiving water. Therefore, the maximum running 30-day average effluent temperature of 24°C (based on temperature data from January 2003 – August 2006) and the maximum 30-day effluent pH of 7.8 (based on pH data from June 2006 – March 2008) were used to calculate the 30-day CCC. The resulting 30-day CCC is 1.73 mg/L (as N). The 4-day average concentration is derived in accordance with the USEPA criterion as 2.5 times the

30-day CCC. Based on a 30-day CCC of 1.73 mg/L (as N), the 4-day average concentration, that should not be exceeded, is 4.33 mg/L.

The MEC for ammonia was 18 mg/L, based on 16 samples collected between May 2003 and February 2007, while the maximum observed upstream receiving water ammonia concentration was 0.3 mg/L, based on four samples collected between January 2002 and December 2002. Therefore, ammonia in the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a level necessary to protect aquatic life resulting in a violation of the Basin Plan's narrative toxicity objective.

The previous Order included effluent limitations for ammonia that varied based on pH and temperature of the discharge using the NAWQC equations to calculate the 1-hr and 30-day criteria. In addition, pending completion of the Dilution/Mixing Zone Study, the Discharger was provided with a dilution credit of 10:1 for compliance with chronic criteria. However, with regard to variable or "floating" effluent limitations, the State Water Board in WQO 2004-0013 for the City of Yuba City, stated that, "*We recommend that the Regional Board establish either fixed or seasonal effluent limitations for metals, as provided in the SIP, rather than "floating" effluent limitations.*" Therefore, to be consistent with the State Water Board's recommendation this Order includes fixed effluent limitations for ammonia (as N). Furthermore, as discussed in Section IV.C.2.c., above, the Discharger has not provided sufficient justification for a dilution credit for acute and chronic aquatic life criteria. Therefore, final Average Monthly Effluent Limitations (AMEL) and Maximum Daily Effluent Limitations (MDEL) of 1.3 mg/L and 2.1 mg/L, respectively, are included in this Order and were calculated without the benefit of dilution. (See Table F-6 in this Fact Sheet for WQBEL calculations).

Based on the effluent sample analytical results, it appears that the Discharger may be in immediate non-compliance upon issuance of the permit. New or modified control measures may be necessary in order to comply with the effluent limitations, and the new or modified control measures cannot be designed, installed and put into operation within 30 calendar days. The Basin Plan for the Sacramento and San Joaquin River Basins includes a provision that authorizes the use of compliance schedules in NPDES permits for water quality objectives adopted after 25 September 1995 (See Basin Plan at page IV-16). The water quality-based effluent limitations for ammonia are based on a new interpretation of the narrative standard for protection of receiving water beneficial uses. Therefore, a compliance schedule for compliance with the ammonia effluent limitations is established in the Order. This compliance schedule is contingent upon the Discharger submitting a compliance schedule justification for ammonia **by the effective date of this Order**. The compliance schedule justification shall include all items specified in Paragraph 3, items (a) through (d), of section 2.1 of the SIP.

An interim performance-based maximum daily limitation of 23.8 mg/L was calculated using the statistical methods for calculating interim effluent limitations described in Attachment F, Section IV.E.3. However, for some effluent pH and temperature values this performance-based effluent limitation is less stringent than the final "floating" effluent limitations for ammonia from the previous Order. Therefore, the "floating" AMEL and MDEL for ammonia are established as the interim limitations in this Order, not to exceed 23.8 mg/L as N (see Attachment G for the interim ammonia effluent limitations). Provided the Discharger submits a compliance schedule justification for ammonia the interim effluent limitations are in effect until **30 September 2013**. As part of the compliance schedule, this Order requires the Discharger to submit a corrective action plan and implementation schedule to assure compliance with the final ammonia effluent limitations. In addition, the Discharger shall submit and implement a pollution prevention plan in accordance with CWC section 13263.3(d)(3).

g. **Bis(2-ethylhexyl)phthalate.** The State primary MCL for bis(2 ethylhexyl)phthalate is 4 µg/l and the USEPA primary MCL is 6 µg/l. The NTR criterion for Human health protection for consumption of water and aquatic organisms is 1.8 µg/l and for consumption of aquatic organisms only is 5.9 µg/l.

   The MEC for bis(2-ethylhexyl)phthalate was 11 µg/L based on 4 samples collected between January 2002 and December 2002. Bis(2-ethylhexyl) phthalate was also detected in upstream receiving water at 9 µg/L in one of the 4 samples taken during the same period. A concentration of 9 µg/L in the receiving water is highly unusual. There is uncertainty in these results, because, bis(2-ethylhexyl) phthalate samples can be easily contaminated when plastic containers are used or by the use of rubber gloves. Therefore, the Regional Water Board does not have confidence that the above results are representative of the discharge or the receiving water and an RPA could not be performed. This Order requires the Discharger to conduct a 1-year study to sample monthly for bis(2-ethylhexyl) phthalate in the effluent and receiving water using clean sampling techniques. Should monitoring results indicate that the discharge has a reasonable potential to cause or contribute to an exceedance of the human health water quality criteria, this Order may be reopened to add an effluent limit for bis(2-ethylhexyl) phthalate.

h. **Chlorine Residual.** Chlorine is used for disinfection at both the Sonora Regional Wastewater Treatment Plant and Jamestown Wastewater Treatment Plant. Chlorine is extremely toxic to aquatic organisms. Due to the use of chlorine, the effluent has a reasonable potential to cause or contribute to an exceedance of the Basin Plan's narrative toxicity objective in the receiving water.

   Effluent wastewater from the wastewater treatment facilities is stored in Quartz Reservoir prior to discharge to Woods Creek. Quartz Reservoir provides a significant amount of detention time prior to effluent discharge, therefore, since chlorine quickly oxidizes, it is unlikely that any chlorine residual will be discharged to Woods Creek. The previous Order required daily monitoring of chlorine residual when discharging to Woods Creek and chlorine has never been

detected in the effluent (<0.01).

Effluent limitations for residual chlorine were included in the previous Order for total residual chlorine as a 1-hour average of 0.019 mg/L and a weekly average of 0.011 mg/L, which were based on USEPA's National Recommended Ambient Water Quality Criteria for protection of freshwater aquatic life for chlorine. To determine compliance with a 1-hour average effluent limitation it is necessary to monitor the effluent continuously. Continuous monitoring is not appropriate for this Facility due to the long detention time in Quartz Reservoir; therefore, this Order includes total residual chlorine effluent limitations of 0.01 mg/L and 0.02 mg/L, as an AMEL and MDEL, respectively, and requires daily effluent monitoring using grab samples when discharging to Woods Creek.

i. **Chloroform.** The Basin Plan contains the *Policy for Application of Water Quality Objectives*, which provides that narrative objectives may be translated using numerical limits published by other agencies and organizations. The California Environmental Protection Agency (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) has published the Toxicity Criteria Database, which contains cancer potency factors for chemicals, including chloroform, that have been used as a basis for regulatory actions by the boards, departments and offices within Cal/EPA. The OEHHA cancer potency value for oral exposure to chloroform is 0.031 milligrams per kilogram body weight per day (mg/kg-day). By applying standard toxicological assumptions used by OEHHA and USEPA in evaluating health risks via drinking water exposure of 70 kilograms (kg) body weight and two liters per day water consumption, this cancer potency factor is equivalent to a concentration in drinking water of 1.1 µg/L (ppb) at the one-in-a-million cancer risk level. This OEHHA concentration is generally applied when there is a drinking water intake immediately downstream of a discharge. However, because there is not a drinking water intake directly downstream of Discharge Point No. 001, the OEHHA criterion will not be applied. The DHS Primary MCL and USEPA Primary MCL for trihalomethanes of 80 µg/L have been used to determine reasonable potential based on the protection of MUN beneficial use of the receiving water.

   The observed chloroform MEC was 2.4 µg/L, based on twelve effluent samples collected between January 2002 and December 2002. The highest observed background data for chloroform MEC was non-detect in samples collected during the same period. The MEC and background concentration do not exceed the water quality criterion; therefore, an effluent limitation for chloroform is not required.

j. **Copper.** The CTR includes hardness-dependent criteria for the protection of freshwater aquatic life for copper. The criteria for copper are presented in dissolved concentrations. USEPA recommends conversion factors to translate dissolved concentrations to total concentrations. The USEPA default conversion factors for copper in freshwater are 0.96 for both the acute and the chronic criteria. Using the worst-case measured hardness from the effluent (70 mg/L as $CaCO_3$) and the USEPA recommended dissolved-to-total translator, the

applicable chronic criterion (maximum four-day average concentration) is 6.9 µg/L, as total recoverable, and the applicable acute criterion (maximum one-hour average concentration) is 10 µg/L, as total recoverable.

The MEC for total copper was 16.4 µg/L, based on 12 samples collected between January 2002 and December 2002, while the maximum observed upstream receiving water total copper concentration was 5.6 µg/L, based on12 samples collected during the same period. Therefore, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR criteria for copper. An AMEL and MDEL for total copper of 5.6 µg/L and 9.3 µg/L, respectively, are included in this Order based on CTR criteria for the protection of freshwater aquatic life (See Attachment F, Table F-7 for WQBEL calculations).

Based on reported effluent data, the Discharger will be unable to comply with these limitations. Section 2.1 of the SIP allows for compliance schedules within the permit for existing discharges where it is demonstrated that it is infeasible for a Discharger to achieve immediate compliance with a CTR criterion. Using the statistical methods for calculating interim effluent limitations described in Attachment F, Section IV.E, an interim performance-based maximum daily limitation of 21.4 µg/L was calculated.

Section 2.1 of the SIP provides that: "*Based on an existing discharger's request and demonstration that it is infeasible for the discharger to achieve immediate compliance with a CTR criterion, or with an effluent limitation based on a CTR criterion, the RWQCB may establish a compliance schedule in an NPDES permit.*" Section 2.1, further states that compliance schedules may be included in NPDES permits provided that the following justification has been submitted: ..."*(a) documentation that diligent efforts have been made to quantify pollutant levels in the discharge and the sources of the pollutant in the waste stream; (b) documentation of source control measures and/or pollution minimization measures efforts currently underway or completed; (c) a proposal for additional or future source control measures, pollutant minimization actions, or waste treatment (i.e., facility upgrades); and (d) a demonstration that the proposed schedule is as short as practicable.*" This compliance schedule is contingent upon the Discharger submitting a compliance schedule justification for copper **by the effective date of this Order**. The compliance schedule justification shall include all items specified in Paragraph 3, items (a) through (d), of section 2.1 of the SIP. Provided the Discharger submits a compliance schedule justification for copper the new WQBELs for *copper* become effective on **18 May 2010**.

This Order requires the Discharger to submit a corrective action plan and implementation schedule to assure compliance with the final copper effluent limitations. The interim effluent limitations are in effect through **17 May 2010**. As part of the compliance schedule for copper, the Discharger shall develop and implement a pollution prevention plan in compliance with CWC section 13263.3(d)(3).

k. **Iron.** The Secondary Maximum Contaminant Level (MCL) - Consumer Acceptance Limit for iron is 300 µg/L. The maximum annual average effluent concentration for iron was 151 µg/L, based on 12 samples collected between January 2002 and December 2002, while the maximum annual average upstream receiving water iron concentration was 177 µg/L, based on 12 samples collected during the same period. The maximum annual average receiving water and effluent concentrations were used in the RPA for evaluating the secondary MCL based on input from the California Department of Public Health and the fact that MCLs are designed to protect human health over long exposure periods. Therefore, it was considered appropriate to analyze reasonable potential based on an annual average concentration.

l. **Manganese**. The Secondary MCL - Consumer Acceptance Limit for manganese is 50 µg/L. The maximum annual average effluent concentration for manganese was 67 µg/L, based on 12 samples collected between January 2002 and December 2002, while the maximum annual average upstream receiving water manganese concentration was 22 µg/L, based on 12 samples collected between January 2002 and December 2002. Therefore, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the Secondary MCL for manganese. The maximum observed receiving water manganese concentration was less than the secondary MCL; therefore assimilative capacity for manganese is available. The Regional Water Board calculates WQBELs in accordance with SIP procedures for non-CTR constituents, and manganese is a non-CTR constituent. The effluent limitation calculation procedures in Section 1.4 of the SIP allow for the granting of dilution credit based on the estimated critical receiving water flow of the Woods Creek. This Order includes Discharge Prohibition III.E. that requires at least a 20:1 flow ratio (Woods Creek:effluent) at all times. Therefore, this Order allows a dilution credit for compliance with water quality objective for manganese.

   WQBELs calculated using these allowable dilution credits result in 326 µg/l. However, the Regional Water Board finds that granting of this dilution credit could allocate an unnecessarily large portion of the receiving water's assimilative capacity for manganese and could violate the Antidegradation Policy. For this reason, a more stringent performance-based effluent limitation is more appropriate. A performance-based MDEL of 192 µg/L is included in this order and it is calculated in the same way that interim limits are calculated (see Section IV.E.1 below).

m. **Nitrate and Nitrite.** Untreated domestic wastewater contains ammonia. Nitrification is a biological process that converts ammonia to nitrite and nitrite to nitrate. Denitrification is a process that converts nitrate to nitrite or nitric oxide and then to nitrous oxide or nitrogen gas, which is then released to the atmosphere. Nitrate and nitrite are known to cause adverse health effects in humans. The California Department of Public Health (CDPH) has adopted a Primary MCL at Title 22 of the California Code of Regulations (CCR), Table 64431-A, for the protection of human health for nitrite and nitrate that are equal to 1 mg/l and 10

mg/l (measured as nitrogen), respectively. Title 22 CCR, Table 6443-A, also includes a primary MCL of 10,000 µg/l for the sum of nitrate and nitrite, measured as nitrogen.

USEPA has developed a primary MCL and an MCL goal of 1,000 µg/L for nitrite (as nitrogen). For nitrate, USEPA has developed Drinking Water Standards (10,000 µg/L as Primary Maximum Contaminant Level) and Ambient Water Quality Criteria for protection of human health (10,000 µg/L for non-cancer health effects). Recent toxicity studies have indicated a possibility that nitrate is toxic to aquatic organisms.

The MEC for nitrate was 6.85 mg/L, based on 12 samples collected between January 2002 and December 2002, while the maximum observed upstream receiving water nitrate concentration was 0.59 mg/l based on 12 samples collected during the same period. The MEC for nitrite was 2.34 mg/L, based on 12 samples collected between January 2002 and December 2002, while the maximum observed upstream receiving water nitrite concentration was non-detect based on 12 samples collected during the same period. The nitrate value in the effluent does not exceed the California Primary MCL. But since nitrate and nitrite are typically present in the domestic wastewater and the plant is not designed to nitrify/denitrify, the nitrate and nitrite likely will be present in the discharge. Inadequate or incomplete de-nitrification may result in the discharge of nitrate and/or nitrite to the receiving stream. The conversion of ammonia to nitrites and the conversion of nitrites to nitrates present a reasonable potential for the discharge to cause or contribute to an in-stream excursion above the Primary MCLs for nitrite and nitrate.

Since the maximum ambient background nitrate and nitrite concentrations are less than the applicable criteria, the receiving water has assimilative capacity for these constituents. As described in Section IV.C.2.c. of this Fact Sheet, a dilution credit of up to 20:1 may be allowed for long-term human health criteria, which results in an AMEL of 198 mg/L for nitrate (as N) and an AMEL of 21 mg/L for nitrite (as N). Although, the Regional Water Board finds that granting of this dilution credit could allocate an unnecessarily large portion of the receiving water's assimilative capacity for the Basin Plan's chemical constituents objective for nitrate plus nitrite and could violate the Antidegradation Policy, a more stringent performance-based effluent limitation cannot be calculated at this time. Since this Order includes new, more stringent effluent limitations for ammonia, which will require nitrification, the current treatment plant performance for nitrate and nitrite does not reflect future performance. Consequently, the WQBELs for nitrate and nitrite, discussed above, are included in this Order.

n. **Oil and Grease.** Untreated domestic wastewater contains oil and grease. The Basin Plan includes a water quality objective for oil and grease in surface waters, which states: "*Waters shall not contain oils, greases, waxes, or other materials in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses*". The previous Order included numeric monthly average and

daily maximum Effluent Limitations of 10 mg/L and 15 mg/L, respectively, to implement the Basin Plan's narrative objective, however, the previous Order did not include an effluent monitoring requirement for oil and grease. Therefore, it is unknown if the discharge still has reasonable potential to cause or contribute to an excursion of the Basin Plan's narrative objective. In accordance with federal anti-backsliding regulations, this Order carries forward the effluent limitation from the previous Order.

o. **Pathogens**. Municipal and domestic supply, agricultural irrigation, and body contact water recreation are beneficial uses of the receiving stream. Coliform limits are imposed to protect the beneficial uses of the receiving water, including public health through contact recreation and drinking water pathways. In a letter to the Regional Water Board dated 8 April 1999, the California Department of Public Health indicated that it would consider wastewater discharged to water bodies with identified beneficial uses of irrigation or contact recreation and where the wastewater receives dilution of at least 20:1 to be adequately disinfected if the effluent coliform concentration does not exceed 23 MPN/100 mL as a 7-day median and does not exceed 240 MPN/100 mL more than once in any 30 day period. Since this Order requires a 20:1 dilution ratio (creek: effluent), it is appropriate to require CDPH's recommendations for disinfection as discussed above. To be consistent with the federal anti-backsliding regulations, this Order includes a MDEL of 230 MPN/100 mL, which is carried forward from the previous Order.

p. **pH.** The Basin Plan includes a water quality objective for surface waters (except for Goose Lake) that the "*...pH shall not be depressed below 6.5 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5 in fresh waters with designated COLD or WARM beneficial uses.*" Effluent Limitations for pH are included in this Order based on the Basin Plan objectives for pH.

q. **Salinity.** The discharge contains total dissolved solids (TDS), chloride, sulfate, and electrical conductivity (EC). These are water quality parameters that are indicative of the salinity of the water. Their presence in water can be growth limiting to certain agricultural crops and can affect the taste of water for human consumption. The Basin Plan contains a chemical constituent objective that incorporates State MCLs and contains a narrative objective for EC, TDS, Sulfate, and Chloride. In addition, there are USEPA water quality criteria for the protection of aquatic organisms for chloride. See Table F-3, below, for the applicable water quality objectives.

Table F-4. Salinity Water Quality Criteria/Objectives

Parameter	Agricultural WQ Goal[1]	Secondary MCL[3]	USEPA Water Quality Criteria
EC (µmhos/cm)	Varies[2]	900, 1600, 2200	N.A.
TDS (mg/L)	Varies	500, 1000, 1500	N.A.
Sulfate (mg/L)	Varies	250, 500, 600	N.A.
Chloride (mg/L)	Varies	250, 500, 600	230 (4-day) 860 (1-hr)

[1] Agricultural water quality goals based on *Water Quality for Agriculture*, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985)

[2] The EC level in irrigation water that harms crop production depends on the crop type, soil type, irrigation methods, rainfall, and other factors. An EC level of 700 umhos/cm is generally considered to present no risk of salinity impacts to crops. However, many crops are grown successfully with higher salinities.

[3] The secondary MCLs are stated as a recommended level, upper level, and a short-term maximum level.

i. **Chloride**. The secondary MCL for chloride is 250 mg/L, as recommended level, 500 mg/L as an upper level, and 600 mg/L as a short-term maximum. The recommended agricultural water quality goal for chloride, that would apply the narrative chemical constituent objective, is 106 mg/L as a long-term average based on Water Quality for Agriculture, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985). The 106 mg/L water quality goal is intended to protect against adverse effects on sensitive crops when irrigated via sprinklers.

Chloride concentrations in the effluent ranged from 9.42 mg/L to 74.2 mg/L, with an average of 62 mg/L, for 12 samples collected by the Discharger from January 2002 through December 2002. Background concentrations in receiving water averaged 9.5 mg/L from 12 samples collected by the Discharger during the same period. Both the receiving water and the effluent are within the agricultural water quality goal of 106 mg/L. Based on this data, the discharge does not have a reasonable potential to cause or contribute to an exceedance of the applicable water quality objectives for Chloride.

ii. **Electrical Conductivity (EC)**. The secondary MCL for EC is 900 µmhos/cm as a recommended level, 1600 µmhos/cm as an upper level, and 2200 µmhos/cm as a short-term maximum. The agricultural water quality goal, that would apply the narrative chemical constituents objective, is 700 µmhos/cm as a long-term average based on Water Quality for Agriculture, Food and Agriculture Organization of the United Nations—